

**Pathologies of the New Guinea Sugarcane Weevil Grub,
Rhabdoscelus obscurus (Boisduval) (Coleoptera:
Curculionidae), Caused by the "Parasitoid"
Cane Weevil Tachinid, *Lixophaga*
sphenophori (Villeneuve)
(Diptera: Tachinidae)**

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The purpose of this paper is to publish some previously unwitnessed pathologies by, and activities of, the maggot of the cane weevil tachinid, *L. sphenophori*, in the grub of the New Guinea sugarcane weevil, *R. obscurus*.

ENTRY ACTIVITY AND PATHOLOGIES

Francis X. Williams (1931) indicates that the parasitic tachinid is larviposited in the entrance of a tunnel made and occupied by a host sugarcane weevil grub. The larviphagous maggot seeks out and penetrates the integument of the host in some unknown manner and location. The parasite evidently does not cause any noticeable entry pathologies. It is theorized that the maggot penetrates the integument at some weak point in the body wall, such as the intersegmental membrane or spiracle. However, entry has never been observed and still remains undocumented.

INTERNAL ACTIVITY AND PATHOLOGIES

Four normal grubs (14–16 days old) were observed and dissected. These were active, uniformly grub-white in color, and of usual size. The organs were not visible externally, and internally their body cavities were filled with fat bodies.

Two larvae, exposed to a gravid female tachinid adult 6 days previously, were dissected. In each grub, one maggot instar-I (assumed) was observed firmly attached by its caudal spiracles to what appeared to be the internal dorsal body wall in the central part of the abdomen. There was a breakdown or change in the fat tissue immediately adjacent to or surrounding the maggot's body. This abnormal tissue, appearing as a membranous cottony substance, was evidently the early stages of the sheath or sac forming around the parasite. This has been cited by Clausen (1940) as being a defensive reaction of the host. However, it could well be initiated by enzymes released by the maggot, or a combination of both.

Four grubs, 9 days after exposure to larvipositing females, were ob-

served and dissected. At this stage, parasite activity produced a characteristic discolored bulge in the abdomen of the host. In a grub that was attacked by several parasites, the alimentary tract could be seen through the integument because of the reduced number of fat bodies.

In the body of a grub, a maggot was found attached to a spiracle of the fourth abdominal segment and another to a spiracle of the prothorax. From instar-II (assumed) until pre-emergence, the maggot remained affixed by the caudal spiracles to a host spiracle. The maggots at this stage were enveloped in a membranous sac which was open at the anterior end. The anterior end of the maggot and its encasement sac swings freely in all directions. The maggot protrudes from the sac to feed and withdraws back into the sac at will. If this sac is formed as a defensive reaction of the host to the presence of the parasite, then this protrusion-withdrawal action would be necessary to prevent complete encapsulation.

Thirteen days after exposure to the parasites, a second group of 4 grubs was dissected. Three did not appear markedly different from the larvae dissected 9 days after exposure. Externally, the grubs were all abnormally small, sluggish, off-white to dark in color, with a characteristic abdominal bulge. Internally, most of the fat bodies were missing.

EXIT ACTIVITY AND PATHOLOGIES

By a stroke of luck, the last grub of the 13-day group was observed when the parasitoid maggot was just preparing to emerge from the host. The tachinid maggot was observed free of its sac with its caudal end pressed firmly into the internal anal end of the grub. The maggot accomplished emergence by a pulsating expansion of its caudal end which was analogous to the action of the ptilinum in some Diptera. The host's anal end ruptured or burst apart due to pressure exerted by this action. The pressure exerted by the parasite must have been great as the grub's integument is quite resilient and difficult to tear. The host grub was moribund at the time the maggot was emerging. The integument of the host was flaccid.

In 3 other grubs which were observed 13 days after exposure, there were one, two, and three maggots freshly emerged from their respective grub hosts. The grub with one emerged maggot did not have any abdominal fat bodies and the segments caudal of the seventh abdominal segment (segments eight and nine) were missing. The remaining internal contents were liquefied and the integument was flaccid. The grub with two emerged maggots had no internal contents remaining and the abdomen was completely devoured (thorax and head capsule remaining). The head capsule was all that remained of the grub with three emerged maggots. This pattern was observed several times.

CONCLUSION

The method or point of entry of the maggot of *L. sphenophori* into the body of the grub, *R. obscurus*, was not observed. However, internally, it was definitely established that the parasite maggot attaches its caudal end to a spiracle of the host in an early instar, is enveloped in a membranous sac, and maintains a fixed position at the point of attachment. The maggot is capable of swinging in a 360-degree cone-shaped pattern to feed. The parasite maggot is not free living within the body cavity of the host as was previously believed, but leaves its membranous sac when it is ready to emerge from the host grub. Exit by the maggot was not made by a tearing action of the mouth hooks but by mechanical pressure exerted by the maggot's caudal end in the form of a pulsating inflation-deflation action causing the anal end of the grub to burst open.

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